

# SEQUENCE LISTING

<110> Levinson, Douglas A.  
Lloyd, Clare M.  
McCarthy, Sean A.

<120> COMPOSITIONS AND METHODS FOR THE TREATMENT AND  
DIAGNOSIS OF IMMUNE DISORDERS

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<141> 1999-06-02

<150> 09/032,337

<151> 1998-02-27

<150> 08/609,583

<151> 1996-03-01

<150> 08/487,748

<151> 1995-06-07

<150> 08/398,633

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<170> PatentIn Ver. 2.0

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|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
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| 300 305 310   |      |
| cgt cgc cac tcc tcc cca tac tgg atc ctg aag aac tcc tgg gga gct | 1011 |
| Arg Arg His Ser Ser Pro Tyr Trp Ile Leu Lys Asn Ser Trp Gly Ala |      |
| 315 320 325 330   |      |
| cac tgg ggc gag aag ggt tac ttc agg ctg tat cgg gga aac aac acc | 1059 |
| His Trp Gly Glu Lys Gly Tyr Phe Arg Leu Tyr Arg Gly Asn Asn Thr |      |
| 335 340 345   |      |
| tgt gga gtc acc aag tat ccc ttc aca gct caa gtg gac tca cca gta | 1107 |
| Cys Gly Val Thr Lys Tyr Pro Phe Thr Ala Gln Val Asp Ser Pro Val |      |
| 350 355 360   |      |
| aag aag gca cgg acc tct tgt cct ccc tga aggcagcagv cactcttctg   | 1157 |
| Lys Lys Ala Arg Thr Ser Cys Pro Pro                             |      |
| 365 370   |      |

cttctccac atggccactg ccccttgta gccctgccca catcctctct gtatggcttc 1217  
 ataaaccaag actgctccgt gaaaaaaaaa aaaaaaaaaa 1257

<210> 12  
 <211> 371  
 <212> PRT  
 <213> Mus musculus

<400> 12  
 Met Thr Leu Thr Ala His Leu Ser Tyr Phe Leu Val Leu Leu Leu Ala  
 1 5 10 15  
 Gly Gln Gly Leu Ser Asp Ser Leu Leu Thr Lys Asp Ala Gly Pro Arg  
 20 25 30  
 Pro Leu Glu Leu Lys Glu Val Phe Lys Leu Phe Gln Ile Arg Phe Asn  
 35 40 45  
 Arg Ser Tyr Trp Asn Pro Ala Glu Tyr Thr Arg Arg Leu Ser Ile Phe  
 50 55 60  
 Ala His Asn Leu Ala Gln Ala Gln Arg Leu Gln Gln Glu Asp Leu Gly  
 65 70 75 80  
 Thr Ala Glu Phe Gly Glu Thr Pro Phe Ser Asp Leu Thr Glu Glu Glu  
 85 90 95  
 Phe Gly Gln Leu Tyr Gly Gln Glu Arg Ser Pro Glu Arg Thr Pro Asn  
 100 105 110  
 Met Thr Lys Lys Val Glu Ser Asn Thr Trp Gly Glu Ser Val Pro Arg  
 115 120 125  
 Thr Cys Asp Trp Arg Lys Ala Lys Asn Ile Ile Ser Ser Val Lys Asn  
 130 135 140  
 Gln Gly Ser Cys Lys Cys Cys Trp Ala Met Ala Ala Ala Asp Asn Ile  
 145 150 155 160  
 Gln Ala Leu Trp Arg Ile Lys His Gln Gln Phe Val Asp Val Ser Val  
 165 170 175  
 Gln Glu Leu Leu Asp Cys Glu Arg Cys Gly Asn Gly Cys Asn Gly Gly  
 180 185 190  
 Phe Val Trp Asp Ala Tyr Leu Thr Val Leu Asn Asn Ser Gly Leu Ala  
 195 200 205  
 Ser Glu Lys Asp Tyr Pro Phe Gln Gly Asp Arg Lys Pro His Arg Cys  
 210 215 220  
 Leu Ala Lys Lys Tyr Lys Lys Val Ala Trp Ile Gln Asp Phe Thr Met  
 225 230 235 240  
 Leu Ser Asn Asn Glu Gln Ala Ile Ala His Tyr Leu Ala Val His Gly  
 245 250 255

Pro Ile Thr Val Thr Ile Asn Met Lys Leu Leu Gln His Tyr Gln Lys  
260 265 270

Gly Val Ile Lys Ala Thr Pro Ser Ser Cys Asp Pro Arg Gln Val Asp  
275 280 285

His Ser Val Leu Leu Val Gly Phe Gly Lys Glu Lys Glu Gly Met Gln  
290 295 300

Thr Gly Thr Val Leu Ser His Ser Arg Lys Arg Arg His Ser Ser Pro  
305 310 315 320

Tyr Trp Ile Leu Lys Asn Ser Trp Gly Ala His Trp Gly Glu Lys Gly  
325 330 335

Tyr Phe Arg Leu Tyr Arg Gly Asn Asn Thr Cys Gly Val Thr Lys Tyr  
340 345 350

Pro Phe Thr Ala Gln Val Asp Ser Pro Val Lys Lys Ala Arg Thr Ser  
355 360 365

Cys Pro Pro  
370

<210> 13  
<211> 130  
<212> PRT  
<213> Mus musculus

<400> 13  
Met Arg Gln Lys Ala Val Ser Leu Phe Leu Cys Tyr Leu Leu Leu Phe  
1 5 10 15

Thr Cys Ser Gly Val Glu Ala Gly Lys Lys Lys Cys Ser Glu Ser Ser  
20 25 30

Asp Ser Gly Ser Gly Phe Trp Lys Ala Leu Thr Phe Met Ala Val Gly  
35 40 45

Gly Gly Leu Ala Val Ala Gly Leu Pro Ala Leu Gly Phe Thr Gly Ala  
50 55 60

Gly Ile Ala Ala Asn Ser Val Ala Ala Ser Leu Met Ser Trp Ser Ala  
65 70 75 80

Ile Leu Asn Gly Gly Gly Val Pro Ala Gly Gly Leu Val Ala Thr Leu  
85 90 95

Gln Ser Leu Gly Ala Gly Gly Ser Ser Val Ile Thr Gly Asn Ile Gly  
100 105 110

Ala Leu Met Gly Tyr Ala Thr His Lys Tyr Leu Asp Ser Glu Glu Asp  
115 120 125

Glu Glu  
130

<210> 14  
 <211> 130  
 <212> PRT  
 <213> Mus musculus

<400> 14  
 Met Arg Gln Lys Ala Val Ser Val Phe Leu Cys Tyr Leu Leu Leu Phe  
 1 5 10 15  
 Thr Cys Ser Gly Val Glu Ala Gly Lys Lys Lys Cys Ser Glu Ser Ser  
 20 25 30  
 Asp Ser Gly Ser Gly Phe Trp Lys Ala Leu Thr Phe Met Ala Val Gly  
 35 40 45  
 Gly Gly Leu Ala Val Ala Gly Leu Pro Ala Leu Gly Phe Thr Gly Ala  
 50 55 60  
 Gly Ile Ala Ala Asn Ser Val Ala Ala Ser Leu Met Ser Trp Ser Ala  
 65 70 75 80  
 Ile Leu Asn Gly Gly Gly Val Pro Ala Gly Gly Leu Val Ala Thr Leu  
 85 90 95  
 Gln Ser Leu Gly Ala Gly Gly Ser Ser Val Val Ile Gly Asn Ile Gly  
 100 105 110  
 Ala Leu Met Arg Tyr Ala Thr His Lys Tyr Leu Asp Ser Glu Glu Asp  
 115 120 125  
 Glu Glu  
 130

<210> 15  
 <211> 110  
 <212> PRT  
 <213> Mus musculus

<400> 15  
 Val Glu Ala Gly Lys Lys Lys Cys Ser Glu Ser Ser Asp Ser Gly Ser  
 1 5 10 15  
 Gly Phe Trp Lys Ala Leu Thr Phe Met Ala Val Gly Gly Gly Leu Ala  
 20 25 30  
 Val Ala Gly Leu Pro Ala Leu Gly Phe Thr Gly Ala Gly Ile Ala Ala  
 35 40 45  
 Asn Ser Val Ala Ala Ser Leu Met Ser Trp Ser Ala Ile Leu Asn Gly  
 50 55 60  
 Gly Gly Val Pro Ala Gly Gly Leu Val Ala Thr Leu Gln Ser Leu Gly  
 65 70 75 80  
 Ala Gly Gly Ser Ser Val Val Ile Gly Asn Ile Gly Ala Leu Met Gly  
 85 90 95

Tyr Ala Thr His Lys Tyr Leu Asp Ser Glu Glu Asp Glu Glu  
100 105 110

<210> 16  
<211> 107  
<212> PRT  
<213> Mus musculus

<400> 16  
Gly Lys Lys Lys Cys Ser Glu Ser Ser Asp Ser Gly Ser Gly Phe Trp  
1 5 10 15

Lys Ala Leu Thr Phe Met Ala Val Gly Gly Gly Leu Ala Val Ala Gly  
20 25 30

Leu Pro Ala Leu Gly Phe Thr Gly Ala Gly Ile Ala Ala Asn Ser Val  
35 40 45

Ala Ala Ser Leu Met Ser Trp Ser Ala Ile Leu Asn Gly Gly Gly Val  
50 55 60

Pro Ala Gly Gly Leu Val Ala Thr Leu Gln Ser Leu Gly Ala Gly Gly  
65 70 75 80

Ser Ser Val Val Ile Gly Asn Ile Gly Ala Leu Met Gly Tyr Ala Thr  
85 90 95

His Lys Tyr Leu Asp Ser Glu Glu Asp Glu Glu  
100 105

<210> 17  
<211> 122  
<212> PRT  
<213> Mus musculus

<400> 17  
Met Glu Ala Ser Ala Leu Thr Ser Ser Ala Val Thr Ser Val Ala Lys  
1 5 10 15

Val Val Arg Val Ala Ser Gly Ser Ala Val Val Leu Pro Leu Ala Arg  
20 25 30

Ile Ala Thr Val Val Ile Gly Gly Val Val Ala Met Ala Ala Val Pro  
35 40 45

Met Val Leu Ser Ala Met Gly Phe Thr Ala Ala Gly Ile Ala Ser Ser  
50 55 60

Ser Ile Ala Ala Lys Met Met Ser Ala Ala Ala Ile Ala Asn Gly Gly  
65 70 75 80

Gly Val Ala Ser Gly Ser Leu Val Gly Thr Leu Gln Ser Leu Gly Ala  
85 90 95

Thr Gly Leu Ser Gly Leu Thr Lys Phe Ile Leu Gly Ser Ile Gly Ser  
100 105 110

Ala Ile Ala Ala Val Ile Ala Arg Phe Tyr  
 115 120

<210> 18  
 <211> 18  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: primer

<400> 18  
 ttgccataga gagacctc 18

<210> 19  
 <211> 19  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: primer

<400> 19  
 tgctgtccaa ttatacagg 19

<210> 20  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: primer

<400> 20  
 gaacacggca ttgtcactaa ct 22

<210> 21  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: primer

<400> 21  
 cctcatagat gggcactgtg t 21

<210> 22  
 <211> 843  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer

<400> 22

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tcattggaag atgggtataa gggtgaggtt ggtaaaaatg cctatctgcc ctgcagttac 120  
actctaccta catctgggac acttggtgcct atgtgctggg gcaagggatt ctgtcccttg 180  
tcacagtgtg ccaatgagtt gctcagaact gatgaaagaa atgtgacata tcagaaatcc 240  
agcagatacc agctaaaggg cgatctcaac aaaggagatg tgtctctgat cataaagaat 300  
gtgactctgg atgaccatgg gacctactgc tgcaggatac agttcccttg tcttatgaat 360  
gataaaaaat tagaactgaa attagacatc aaagcagcca aggtcactcc agctcagact 420  
gccccatggg actctactac agcttctcca agaaccctaa ccacggagag aaatgggttca 480  
gagacacaga cactgggtgac cctccataat aacaatggaa caaaaatttc cacatgggct 540  
gatgaaatta aggactctgg agaaacgac agaactgcta tccacattgg agtgggagtc 600  
tctgctgggt tgaccctggc acttatcatt ggtgtcttaa tccttaaattg gtattcctgt 660  
aagaaaaaga agttatcgag tttgagcctt attacactgg ccaacttgcc tccaggaggg 720  
ttggcaaatg caggagcagt caggattcgc tctgaggaaa atatctacac catcgaggag 780  
aacgtatatg aagtggagaa ttcaaatgag tactactgct acgtcaacag ccagcagcca 840  
tcc 843

<210> 23

<211> 2236

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (42) .. (944)

<400> 23

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Met Phe Ser His Leu  
1 5  
ccc ttt gac tgt gtc ctg ctg ctg ctg ctg cta cta ctt aca agg tcc 104  
Pro Phe Asp Cys Val Leu Leu Leu Leu Leu Leu Leu Leu Thr Arg Ser  
10 15 20  
tca gaa gtg gaa tac aga gcg gag gtc ggt cag aat gcc tat ctg ccc 152  
Ser Glu Val Glu Tyr Arg Ala Glu Val Gly Gln Asn Ala Tyr Leu Pro  
25 30 35



|   |     |
|---|-----|
| tgc ttc tac acc cca gcc gcc cca ggg aac ctc gtg ccc gtc tgc tgg | 200 |
| Cys Phe Tyr Thr Pro Ala Ala Pro Gly Asn Leu Val Pro Val Cys Trp |     |
| 40 45 50  |     |
| ggc aaa gga gcc tgt cct gtg ttt gaa tgt ggc aac gtg gtg ctc agg | 248 |
| Gly Lys Gly Ala Cys Pro Val Phe Glu Cys Gly Asn Val Val Leu Arg |     |
| 55 60 65  |     |
| act gat gaa agg gat gtg aat tat tgg aca tcc aga tac tgg cta aat | 296 |
| Thr Asp Glu Arg Asp Val Asn Tyr Trp Thr Ser Arg Tyr Trp Leu Asn |     |
| 70 75 80 85   |     |
| ggg gat ttc cgc aaa gga gat gtg tcc ctg acc ata gag aat gtg act | 344 |
| Gly Asp Phe Arg Lys Gly Asp Val Ser Leu Thr Ile Glu Asn Val Thr |     |
| 90 95 100   |     |
| cta gca gac agt ggg atc tac tgc tgc cgg atc caa atc cca ggc ata | 392 |
| Leu Ala Asp Ser Gly Ile Tyr Cys Cys Arg Ile Gln Ile Pro Gly Ile |     |
| 105 110 115   |     |
| atg aat gat gaa aaa ttt aac ctg aag ttg gtc atc aaa cca gcc aag | 440 |
| Met Asn Asp Glu Lys Phe Asn Leu Lys Leu Val Ile Lys Pro Ala Lys |     |
| 120 125 130   |     |
| gtc acc cct gca ccg act ctg cag aga gac ttc act gca gcc ttt cca | 488 |
| Val Thr Pro Ala Pro Thr Leu Gln Arg Asp Phe Thr Ala Ala Phe Pro |     |
| 135 140 145   |     |
| agg atg ctt acc acc agg gga cat ggc cca gca gag aca cag aca ctg | 536 |
| Arg Met Leu Thr Thr Arg Gly His Gly Pro Ala Glu Thr Gln Thr Leu |     |
| 150 155 160 165   |     |
| ggg agc ctc cct gat ata aat cta aca caa ata tcc aca ttg gcc aat | 584 |
| Gly Ser Leu Pro Asp Ile Asn Leu Thr Gln Ile Ser Thr Leu Ala Asn |     |
| 170 175 180   |     |
| gag tta cgg gac tct aga ttg gcc aat gac tta cgg gac tct gga gca | 632 |
| Glu Leu Arg Asp Ser Arg Leu Ala Asn Asp Leu Arg Asp Ser Gly Ala |     |
| 185 190 195   |     |
| acc atc aga ata ggc atc tac atc gga gca ggg atc tgt gct ggg ctg | 680 |
| Thr Ile Arg Ile Gly Ile Tyr Ile Gly Ala Gly Ile Cys Ala Gly Leu |     |
| 200 205 210   |     |
| gct ctg gct ctt atc ttc ggc gct tta att ttc aaa tgg tat tct cat | 728 |
| Ala Leu Ala Leu Ile Phe Gly Ala Leu Ile Phe Lys Trp Tyr Ser His |     |
| 215 220 225   |     |
| agc aaa gag aag ata cag aat tta agc ctc atc tct ttg gcc aac ctc | 776 |
| Ser Lys Glu Lys Ile Gln Asn Leu Ser Leu Ile Ser Leu Ala Asn Leu |     |
| 230 235 240 245   |     |
| cct ccc tca gga ttg gca aat gca gta gca gag gga att cgc tca gaa | 824 |
| Pro Pro Ser Gly Leu Ala Asn Ala Val Ala Glu Gly Ile Arg Ser Glu |     |
| 250 255 260   |     |

gaa aac atc tat acc att gaa gag aac gta tat gaa gtg gag gag ccc 872  
 Glu Asn Ile Tyr Thr Ile Glu Glu Asn Val Tyr Glu Val Glu Glu Pro  
 265 270 275  
 aat gag tat tat tgc tat gtc agc agc agg cag caa ccc tca caa cct 920  
 Asn Glu Tyr Tyr Cys Tyr Val Ser Ser Arg Gln Gln Pro Ser Gln Pro  
 280 285 290  
 ttg ggt tgt cgc ttt gca atg cca tagatccaac caccttattt ttgagcttgg 974  
 Leu Gly Cys Arg Phe Ala Met Pro  
 295 300  
 tgttttgtct ttttcagaaa ctatgagctg tgtcacctga ctggttttgg aggttctgtc 1034  
 cactgctatg gagcagagtt ttcccathtt cagaagataa tgactcacat gggaattgaa 1094  
 ctggggacctg cactgaactt aaacagggcat gtcattgcct ctgtatttaa gccaacagag 1154  
 ttaccaacc cagagactgt taatcatgga tgttagagct caaacgggct tttatataca 1214  
 ctaggaattc ttgacgtggg gtctctggag ctccaggaaa ttcgggcaca tcatatgtcc 1274  
 atgaaacttc agataaacta ggraaaactg ggtgctgagg tgaaagcata acttttttgg 1334  
 cacagaaagt ctaaaggggc cactgatttt caaagagatc tgtgatccct ttttgttttt 1394  
 tgtttttgag atggagtctt gctctgttgc ccaggctgga gtgcaatggc acaatctcgg 1454  
 ctactgcaa gctccgcctc ctgggttcaa gcgattctcc tgcctcagcc tcctgagtgg 1514  
 ctgggattac aggcattgac caccatgccc agctaatttg ttgtattttt agtagagaca 1574  
 gggtttcacc atgttggcca gtgtggtctc aaactcctga cctcatgatt tgcctgcctc 1634  
 ggctcccaa agcactggga ttacaggcgt gagccaccac atccagccag tgatccttaa 1694  
 aagattaaga gatgactgga ctagggtctac cttgatcttg aagattccct tggaatgttg 1754  
 agatttaggc ttatttgagc actacctgcc caactgtcag tgccagtgca tagcccttct 1814  
 tttgtctccc ttatgaagac tgccctgcag ggctgagatg tggcaggagc tcccagggaa 1874  
 aaaggaagtg catttgattg gtgtgtattg gccaaagttt gcttggttggtg tgcttgaaag 1934  
 aaaatatctc tgaccaactt ctgtattcgt ggaccaaact gaagctatat ttttcacaga 1994  
 agaagaagca gtgacgggga cacaattctt gttgcctggg ggaaagaagg caaaggcctt 2054  
 cagcaatcta tattaccagc gctggatcct ttgacagaga gtgggtcccta aacttaaatt 2114  
 tcaagacggt ataggcttga tctgtcttgc ttattgttgc cccctgcgcc tagcacaatt 2174  
 ctgacacaca attggaactt actaaaaatt tttttttact gttaaaaaaa aaaaaaaaaa 2234  
 aa 2236

<210> 24

<211> 301  
 <212> PRT  
 <213> Homo sapiens

<400> 24

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Phe | Ser | His | Leu | Pro | Phe | Asp | Cys | Val | Leu | Leu | Leu | Leu | Leu | Leu | 1   | 5   | 10  | 15  |
| Leu | Leu | Thr | Arg | Ser | Ser | Glu | Val | Glu | Tyr | Arg | Ala | Glu | Val | Gly | Gln | 20  | 25  | 30  |     |
| Asn | Ala | Tyr | Leu | Pro | Cys | Phe | Tyr | Thr | Pro | Ala | Ala | Pro | Gly | Asn | Leu | 35  | 40  | 45  |     |
| Val | Pro | Val | Cys | Trp | Gly | Lys | Gly | Ala | Cys | Pro | Val | Phe | Glu | Cys | Gly | 50  | 55  | 60  |     |
| Asn | Val | Val | Leu | Arg | Thr | Asp | Glu | Arg | Asp | Val | Asn | Tyr | Trp | Thr | Ser | 65  | 70  | 75  | 80  |
| Arg | Tyr | Trp | Leu | Asn | Gly | Asp | Phe | Arg | Lys | Gly | Asp | Val | Ser | Leu | Thr | 85  | 90  | 95  |     |
| Ile | Glu | Asn | Val | Thr | Leu | Ala | Asp | Ser | Gly | Ile | Tyr | Cys | Cys | Arg | Ile | 100 | 105 | 110 |     |
| Gln | Ile | Pro | Gly | Ile | Met | Asn | Asp | Glu | Lys | Phe | Asn | Leu | Lys | Leu | Val | 115 | 120 | 125 |     |
| Ile | Lys | Pro | Ala | Lys | Val | Thr | Pro | Ala | Pro | Thr | Leu | Gln | Arg | Asp | Phe | 130 | 135 | 140 |     |
| Thr | Ala | Ala | Phe | Pro | Arg | Met | Leu | Thr | Thr | Arg | Gly | His | Gly | Pro | Ala | 145 | 150 | 155 | 160 |
| Glu | Thr | Gln | Thr | Leu | Gly | Ser | Leu | Pro | Asp | Ile | Asn | Leu | Thr | Gln | Ile | 165 | 170 | 175 |     |
| Ser | Thr | Leu | Ala | Asn | Glu | Leu | Arg | Asp | Ser | Arg | Leu | Ala | Asn | Asp | Leu | 180 | 185 | 190 |     |
| Arg | Asp | Ser | Gly | Ala | Thr | Ile | Arg | Ile | Gly | Ile | Tyr | Ile | Gly | Ala | Gly | 195 | 200 | 205 |     |
| Ile | Cys | Ala | Gly | Leu | Ala | Leu | Ala | Leu | Ile | Phe | Gly | Ala | Leu | Ile | Phe | 210 | 215 | 220 |     |
| Lys | Trp | Tyr | Ser | His | Ser | Lys | Glu | Lys | Ile | Gln | Asn | Leu | Ser | Leu | Ile | 225 | 230 | 235 | 240 |
| Ser | Leu | Ala | Asn | Leu | Pro | Pro | Ser | Gly | Leu | Ala | Asn | Ala | Val | Ala | Glu | 245 | 250 | 255 |     |
| Gly | Ile | Arg | Ser | Glu | Glu | Asn | Ile | Tyr | Thr | Ile | Glu | Glu | Asn | Val | Tyr | 260 | 265 | 270 |     |
| Glu | Val | Glu | Glu | Pro | Asn | Glu | Tyr | Tyr | Cys | Tyr | Val | Ser | Ser | Arg | Gln | 275 | 280 | 285 |     |



<212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide  
  
 <400> 29  
 ccgcgggtac cagtaaatacg tcctgggggtg g 31  
  
  
 <210> 30  
 <211> 36  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide  
  
 <400> 30  
 aaataaagga tccctacatc cagcaactat gtagta 36  
  
  
 <210> 31  
 <211> 35  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide  
  
 <400> 31  
 gcgcaattga ctagtgaccc acgcgtccgg atttc 35  
  
  
 <210> 32  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide  
  
 <400> 32  
 gacgcggatc ctcaggatgg ctgctggctg 30  
  
  
 <210> 33  
 <211> 38  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide

<400> 33  
gaacacacta gtactatcct gtgccattgc catagaga 38

<210> 34  
<211> 44  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide

<400> 34  
ggaatattgg gcccttggat cccaagtctg cacacctgca ctcc 44

<210> 35  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide

<400> 35  
gtaaatcgtc ctgggggtctg g 21

<210> 36  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide

<400> 36  
cctttctgata acacaagcat aaatc 25

<210> 37  
<211> 903  
<212> DNA  
<213> Homo sapiens

<400> 37  
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tcttcagaag tggaatacag agcggaggtc ggtcagaatg cctatctgcc ctgcttctac 120  
acccagccg cccagggaa cctcgtgcc gtctgctggg gcaaaggagc ctgtcctgtg 180  
tttgaatgtg gcaacgtggt gctcaggact gatgaaagg atgtgaatta ttggacatcc 240  
agatactggc taaatgggga tttccgcaa ggagatgtgt ccctgaccat agagaatgtg 300

actctagcag acagtgggat ctactgctgc cggatccaaa tcccaggcat aatgaatgat 360  
gaaaaattta acctgaagtt ggtcatcaaa ccagccaagg tcacccctgc accgactctg 420  
cagagagact tctactgcagc ctttccaagg atgcttacca ccaggggaca tggcccagca 480  
gagacacaga cactggggag cctccctgat ataaatctaa cacaaatata cacattggcc 540  
aatgagttac gggactctag attggccaat gacttacggg actctggagc aaccatcaga 600  
ataggcatct acatcggagc agggatctgt gctgggctgg ctctggctct tatcttcggc 660  
gctttaattt tcaaattgga ttctcatagc aaagagaaga tacagaattt aagcctcatt 720  
tctttggcca acctccctcc ctccaggattg gcaaattgcag tagcagaggg aattcgctca 780  
gaagaaaaca tctataccat tgaagagaac gtatatgaag tggaggagcc caatgagtat 840  
tattgctatg tcagcagcag gcagcaaccc tcacaacctt tgggttgctg ctttgcaatg 900  
cca 903

<210> 38  
<211> 1704  
<212> DNA  
<213> Mus musculus

<220>  
<221> CAAT\_signal  
<222> (1)..(1704)

<220>  
<221> CDS  
<222> (1)..(1701)

<400> 38  
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Met Ile Asp Arg Gln Arg Met Gly Leu Trp Ala Leu Ala Ile Leu Thr  
1 5 10 15  
ctt ccc atg tat ttg aca gtt acg gag ggc agt aaa tcg tcc tgg ggt 96  
Leu Pro Met Tyr Leu Thr Val Thr Glu Gly Ser Lys Ser Ser Trp Gly  
20 25 30  
ctg gaa aat gag gct tta att gtg aga tgc ccc caa aga gga cgc tcg 144  
Leu Glu Asn Glu Ala Leu Ile Val Arg Cys Pro Gln Arg Gly Arg Ser  
35 40 45  
act tat cct gtg gaa tgg tat tac tca gat aca aat gaa agt att cct 192  
Thr Tyr Pro Val Glu Trp Tyr Tyr Ser Asp Thr Asn Glu Ser Ile Pro  
50 55 60  
act caa aaa aga aat cgg atc ttt gtc tca aga gat cgt ctg aag ttt 240  
Thr Gln Lys Arg Asn Arg Ile Phe Val Ser Arg Asp Arg Leu Lys Phe  
65 70 75 80

|   |     |
|---|-----|
| cta cca gcc aga gtg gaa gac tct ggg att tat gct tgt gtt atc aga | 288 |
| Leu Pro Ala Arg Val Glu Asp Ser Gly Ile Tyr Ala Cys Val Ile Arg |     |
| 85 90 95  |     |
| agc ccc aac ttg aat aag act gga tac ttg aat gtc acc ata cat aaa | 336 |
| Ser Pro Asn Leu Asn Lys Thr Gly Tyr Leu Asn Val Thr Ile His Lys |     |
| 100 105 110   |     |
| aag ccg cca agc tgc aat atc cct gat tat ttg atg tac tcg aca gta | 384 |
| Lys Pro Pro Ser Cys Asn Ile Pro Asp Tyr Leu Met Tyr Ser Thr Val |     |
| 115 120 125   |     |
| cgt gga tca gat aaa aat ttc aag ata acg tgt cca aca att gac ctg | 432 |
| Arg Gly Ser Asp Lys Asn Phe Lys Ile Thr Cys Pro Thr Ile Asp Leu |     |
| 130 135 140   |     |
| tat aat tgg aca gca cct gtt cag tgg ttt aag aac tgc aaa gct ctc | 480 |
| Tyr Asn Trp Thr Ala Pro Val Gln Trp Phe Lys Asn Cys Lys Ala Leu |     |
| 145 150 155 160   |     |
| caa gag cca agg ttc agg gca cac agg tcc tac ttg ttc att gac aac | 528 |
| Gln Glu Pro Arg Phe Arg Ala His Arg Ser Tyr Leu Phe Ile Asp Asn |     |
| 165 170 175   |     |
| gtg act cat gat gat gaa ggt gac tac act tgt caa ttc aca cac gcg | 576 |
| Val Thr His Asp Asp Glu Gly Asp Tyr Thr Cys Gln Phe Thr His Ala |     |
| 180 185 190   |     |
| gag aat gga acc aac tac atc gtg acg gcc acc aga tca ttc aca gtt | 624 |
| Glu Asn Gly Thr Asn Tyr Ile Val Thr Ala Thr Arg Ser Phe Thr Val |     |
| 195 200 205   |     |
| gaa gaa aaa ggc ttt tct atg ttt cca gta att aca aat cct cca tac | 672 |
| Glu Glu Lys Gly Phe Ser Met Phe Pro Val Ile Thr Asn Pro Pro Tyr |     |
| 210 215 220   |     |
| aac cac aca atg gaa gtg gaa ata gga aaa cca gca agt att gcc tgt | 720 |
| Asn His Thr Met Glu Val Glu Ile Gly Lys Pro Ala Ser Ile Ala Cys |     |
| 225 230 235 240   |     |
| tca gct tgc ttt ggc aaa ggc tct cac ttc ttg gct gat gtc ctg tgg | 768 |
| Ser Ala Cys Phe Gly Lys Gly Ser His Phe Leu Ala Asp Val Leu Trp |     |
| 245 250 255   |     |
| cag att aac aaa aca gta gtt gga aat ttt ggt gaa gca aga att caa | 816 |
| Gln Ile Asn Lys Thr Val Val Gly Asn Phe Gly Glu Ala Arg Ile Gln |     |
| 260 265 270   |     |
| gaa gag gaa ggt cga aat gaa agt tcc agc aat gac atg gat tgt tta | 864 |
| Glu Glu Glu Gly Arg Asn Glu Ser Ser Ser Asn Asp Met Asp Cys Leu |     |
| 275 280 285   |     |
| acc tca gtg tta agg ata act ggt gtg aca gaa aag gac ctg tcc ctg | 912 |
| Thr Ser Val Leu Arg Ile Thr Gly Val Thr Glu Lys Asp Leu Ser Leu |     |
| 290 295 300   |     |



|   |      |
|---|------|
| gaa tat gac tgt ctg gcc ctg aac ctt cat ggc atg ata agg cac acc | 960  |
| Glu Tyr Asp Cys Leu Ala Leu Asn Leu His Gly Met Ile Arg His Thr |      |
| 305 310 315 320   |      |
| ata agg ctg aga agg aaa caa cca att gat cac cga agc atc tac tac | 1008 |
| Ile Arg Leu Arg Arg Lys Gln Pro Ile Asp His Arg Ser Ile Tyr Tyr |      |
| 325 330 335   |      |
| ata gtt gct gga tgt agt tta ttg cta atg ttt atc aat gtc ttg gtg | 1056 |
| Ile Val Ala Gly Cys Ser Leu Leu Leu Met Phe Ile Asn Val Leu Val |      |
| 340 345 350   |      |
| ata gtc tta aaa gtg ttc tgg att gag gtt gct ctg ttc tgg aga gat | 1104 |
| Ile Val Leu Lys Val Phe Trp Ile Glu Val Ala Leu Phe Trp Arg Asp |      |
| 355 360 365   |      |
| ata gtg aca cct tac aaa acc cgg aac gat ggc aag ctc tac gat gcg | 1152 |
| Ile Val Thr Pro Tyr Lys Thr Arg Asn Asp Gly Lys Leu Tyr Asp Ala |      |
| 370 375 380   |      |
| tac atc att tac cct cgg gtc ttc cgg ggc agc gcg gcg gga acc cac | 1200 |
| Tyr Ile Ile Tyr Pro Arg Val Phe Arg Gly Ser Ala Ala Gly Thr His |      |
| 385 390 395 400   |      |
| tct gtg gag tac ttt gtt cac cac act ctg ccc gac gtt ctt gaa aat | 1248 |
| Ser Val Glu Tyr Phe Val His His Thr Leu Pro Asp Val Leu Glu Asn |      |
| 405 410 415   |      |
| aaa tgt ggc tac aaa ttg tgc att tat ggg aga gac ctg tta cct ggg | 1296 |
| Lys Cys Gly Tyr Lys Leu Cys Ile Tyr Gly Arg Asp Leu Leu Pro Gly |      |
| 420 425 430   |      |
| caa gat gca gcc acc gtg gtg gaa agc agt atc cag aat agc aga aga | 1344 |
| Gln Asp Ala Ala Thr Val Val Glu Ser Ser Ile Gln Asn Ser Arg Arg |      |
| 435 440 445   |      |
| cag gtg ttt gtt ctg gcc cct cac atg atg cac agc aag gaa ttt gcc | 1392 |
| Gln Val Phe Val Leu Ala Pro His Met Met His Ser Lys Glu Phe Ala |      |
| 450 455 460   |      |
| tac gag cag gag att gct ctg cac agc gcc ctc atc cag aac aac tcc | 1440 |
| Tyr Glu Gln Glu Ile Ala Leu His Ser Ala Leu Ile Gln Asn Asn Ser |      |
| 465 470 475 480   |      |
| aag gtg att ctt att gaa atg gag cct ctg ggt gag gca agc cga cta | 1488 |
| Lys Val Ile Leu Ile Glu Met Glu Pro Leu Gly Glu Ala Ser Arg Leu |      |
| 485 490 495   |      |
| cag gtt ggg gac ctg caa gat tct ctc cag cat ctt gtg aaa att cag | 1536 |
| Gln Val Gly Asp Leu Gln Asp Ser Leu Gln His Leu Val Lys Ile Gln |      |
| 500 505 510   |      |
| ggg acc atc aag tgg agg gaa gat cat gtg gcc gac aag cag tct cta | 1584 |
| Gly Thr Ile Lys Trp Arg Glu Asp His Val Ala Asp Lys Gln Ser Leu |      |
| 515 520 525   |      |

agt tcc aaa ttc tgg aag cat gtg agg tac caa atg cca gtg cca gaa 1632  
 Ser Ser Lys Phe Trp Lys His Val Arg Tyr Gln Met Pro Val Pro Glu  
 530 535 540

aga gcc tcc aag acg gca tct gtt gcg gct ccg ttg agt ggc aag gca 1680  
 Arg Ala Ser Lys Thr Ala Ser Val Ala Ala Pro Leu Ser Gly Lys Ala  
 545 550 555 560

tgc tta gac ctg aaa cac ttt tga 1704  
 Cys Leu Asp Leu Lys His Phe  
 565

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Leu Glu Asn Glu Ala Leu Ile Val Arg Cys Pro Gln Arg Gly Arg Ser  
 35 40 45

Thr Tyr Pro Val Glu Trp Tyr Tyr Ser Asp Thr Asn Glu Ser Ile Pro  
 50 55 60

Thr Gln Lys Arg Asn Arg Ile Phe Val Ser Arg Asp Arg Leu Lys Phe  
 65 70 75 80

Leu Pro Ala Arg Val Glu Asp Ser Gly Ile Tyr Ala Cys Val Ile Arg  
 85 90 95

Ser Pro Asn Leu Asn Lys Thr Gly Tyr Leu Asn Val Thr Ile His Lys  
 100 105 110

Lys Pro Pro Ser Cys Asn Ile Pro Asp Tyr Leu Met Tyr Ser Thr Val  
 115 120 125

Arg Gly Ser Asp Lys Asn Phe Lys Ile Thr Cys Pro Thr Ile Asp Leu  
 130 135 140

Tyr Asn Trp Thr Ala Pro Val Gln Trp Phe Lys Asn Cys Lys Ala Leu  
 145 150 155 160

Gln Glu Pro Arg Phe Arg Ala His Arg Ser Tyr Leu Phe Ile Asp Asn  
 165 170 175

Val Thr His Asp Asp Glu Gly Asp Tyr Thr Cys Gln Phe Thr His Ala  
 180 185 190

Glu Asn Gly Thr Asn Tyr Ile Val Thr Ala Thr Arg Ser Phe Thr Val  
 195 200 205

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Glu | Glu | Lys | Gly | Phe | Ser | Met | Phe | Pro | Val | Ile | Thr | Asn | Pro | Pro | Tyr |  |  |
| 210 |     |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |  |
| Asn | His | Thr | Met | Glu | Val | Glu | Ile | Gly | Lys | Pro | Ala | Ser | Ile | Ala | Cys |  |  |
| 225 |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     |     | 240 |  |  |
| Ser | Ala | Cys | Phe | Gly | Lys | Gly | Ser | His | Phe | Leu | Ala | Asp | Val | Leu | Trp |  |  |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |     |  |  |
| Gln | Ile | Asn | Lys | Thr | Val | Val | Gly | Asn | Phe | Gly | Glu | Ala | Arg | Ile | Gln |  |  |
|     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |     |  |  |
| Glu | Glu | Glu | Gly | Arg | Asn | Glu | Ser | Ser | Ser | Asn | Asp | Met | Asp | Cys | Leu |  |  |
|     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |     |  |  |
| Thr | Ser | Val | Leu | Arg | Ile | Thr | Gly | Val | Thr | Glu | Lys | Asp | Leu | Ser | Leu |  |  |
| 290 |     |     |     |     | 295 |     |     |     |     |     | 300 |     |     |     |     |  |  |
| Glu | Tyr | Asp | Cys | Leu | Ala | Leu | Asn | Leu | His | Gly | Met | Ile | Arg | His | Thr |  |  |
| 305 |     |     |     | 310 |     |     |     |     |     | 315 |     |     |     |     | 320 |  |  |
| Ile | Arg | Leu | Arg | Arg | Lys | Gln | Pro | Ile | Asp | His | Arg | Ser | Ile | Tyr | Tyr |  |  |
|     |     |     | 325 |     |     |     |     |     | 330 |     |     |     |     | 335 |     |  |  |
| Ile | Val | Ala | Gly | Cys | Ser | Leu | Leu | Leu | Met | Phe | Ile | Asn | Val | Leu | Val |  |  |
|     |     | 340 |     |     |     |     | 345 |     |     |     |     |     | 350 |     |     |  |  |
| Ile | Val | Leu | Lys | Val | Phe | Trp | Ile | Glu | Val | Ala | Leu | Phe | Trp | Arg | Asp |  |  |
|     |     | 355 |     |     |     | 360 |     |     |     |     |     | 365 |     |     |     |  |  |
| Ile | Val | Thr | Pro | Tyr | Lys | Thr | Arg | Asn | Asp | Gly | Lys | Leu | Tyr | Asp | Ala |  |  |
|     | 370 |     |     |     | 375 |     |     |     |     |     | 380 |     |     |     |     |  |  |
| Tyr | Ile | Ile | Tyr | Pro | Arg | Val | Phe | Arg | Gly | Ser | Ala | Ala | Gly | Thr | His |  |  |
| 385 |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |     |  |  |
| Ser | Val | Glu | Tyr | Phe | Val | His | His | Thr | Leu | Pro | Asp | Val | Leu | Glu | Asn |  |  |
|     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |     |  |  |
| Lys | Cys | Gly | Tyr | Lys | Leu | Cys | Ile | Tyr | Gly | Arg | Asp | Leu | Leu | Pro | Gly |  |  |
|     |     | 420 |     |     |     |     | 425 |     |     |     |     |     | 430 |     |     |  |  |
| Gln | Asp | Ala | Ala | Thr | Val | Val | Glu | Ser | Ser | Ile | Gln | Asn | Ser | Arg | Arg |  |  |
|     | 435 |     |     |     |     | 440 |     |     |     |     |     | 445 |     |     |     |  |  |
| Gln | Val | Phe | Val | Leu | Ala | Pro | His | Met | Met | His | Ser | Lys | Glu | Phe | Ala |  |  |
|     | 450 |     |     |     | 455 |     |     |     |     |     | 460 |     |     |     |     |  |  |
| Tyr | Glu | Gln | Glu | Ile | Ala | Leu | His | Ser | Ala | Leu | Ile | Gln | Asn | Asn | Ser |  |  |
| 465 |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |     |  |  |
| Lys | Val | Ile | Leu | Ile | Glu | Met | Glu | Pro | Leu | Gly | Glu | Ala | Ser | Arg | Leu |  |  |
|     |     | 485 |     |     |     |     | 490 |     |     |     |     |     |     | 495 |     |  |  |
| Gln | Val | Gly | Asp | Leu | Gln | Asp | Ser | Leu | Gln | His | Leu | Val | Lys | Ile | Gln |  |  |
|     |     | 500 |     |     |     |     | 505 |     |     |     |     |     | 510 |     |     |  |  |

Gly Thr Ile Lys Trp Arg Glu Asp His Val Ala Asp Lys Gln Ser Leu  
515 520 525

Ser Ser Lys Phe Trp Lys His Val Arg Tyr Gln Met Pro Val Pro Glu  
530 535 540

Arg Ala Ser Lys Thr Ala Ser Val Ala Ala Pro Leu Ser Gly Lys Ala  
545 550 555 560

Cys Leu Asp Leu Lys His Phe  
565

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<211> 1029  
<212> DNA  
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<220>  
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<222> (1)..(1026)

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Met Ile Asp Arg Gln Arg Met Gly Leu Trp Ala Leu Ala Ile Leu Thr  
1 5 10 15

ctt ccc atg tat ttg aca gtt acg gag ggc agt aaa tcg tcc tgg ggt 96  
Leu Pro Met Tyr Leu Thr Val Thr Glu Gly Ser Lys Ser Ser Trp Gly  
20 25 30

ctg gaa aat gag gct tta att gtg aga tgc ccc caa aga gga cgc tcg 144  
Leu Glu Asn Glu Ala Leu Ile Val Arg Cys Pro Gln Arg Gly Arg Ser  
35 40 45

act tat cct gtg gaa tgg tat tac tca gat aca aat gaa agt att cct 192  
Thr Tyr Pro Val Glu Trp Tyr Tyr Ser Asp Thr Asn Glu Ser Ile Pro  
50 55 60

act caa aaa aga aat cgg atc ttt gtc tca aga gat cgt ctg aag ttt 240  
Thr Gln Lys Arg Asn Arg Ile Phe Val Ser Arg Asp Arg Leu Lys Phe  
65 70 75 80

cta cca gcc aga gtg gaa gac tct ggg att tat gct tgt gtt atc aga 288  
Leu Pro Ala Arg Val Glu Asp Ser Gly Ile Tyr Ala Cys Val Ile Arg  
85 90 95

agc ccc aac ttg aat aag act gga tac ttg aat gtc acc ata cat aaa 336  
Ser Pro Asn Leu Asn Lys Thr Gly Tyr Leu Asn Val Thr Ile His Lys  
100 105 110

aag ccg cca agc tgc aat atc cct gat tat ttg atg tac tcg aca gta 384  
Lys Pro Pro Ser Cys Asn Ile Pro Asp Tyr Leu Met Tyr Ser Thr Val  
115 120 125

cgt gga tca gat aaa aat ttc aag ata acg tgt cca aca att gac ctg 432  
Arg Gly Ser Asp Lys Asn Phe Lys Ile Thr Cys Pro Thr Ile Asp Leu  
130 135 140

|   |      |
|---|------|
| tat aat tgg aca gca cct gtt cag tgg ttt aag aac tgc aaa gct ctc | 480  |
| Tyr Asn Trp Thr Ala Pro Val Gln Trp Phe Lys Asn Cys Lys Ala Leu |      |
| 145 150 155 160   |      |
| caa gag cca agg ttc agg gca cac agg tcc tac ttg ttc att gac aac | 528  |
| Gln Glu Pro Arg Phe Arg Ala His Arg Ser Tyr Leu Phe Ile Asp Asn |      |
| 165 170 175   |      |
| gtg act cat gat gat gaa ggt gac tac act tgt caa ttc aca cac gcg | 576  |
| Val Thr His Asp Asp Glu Gly Asp Tyr Thr Cys Gln Phe Thr His Ala |      |
| 180 185 190   |      |
| gag aat gga acc aac tac atc gtg acg gcc acc aga tca ttc aca gtt | 624  |
| Glu Asn Gly Thr Asn Tyr Ile Val Thr Ala Thr Arg Ser Phe Thr Val |      |
| 195 200 205   |      |
| gaa gaa aaa ggc ttt tct atg ttt cca gta att aca aat cct cca tac | 672  |
| Glu Glu Lys Gly Phe Ser Met Phe Pro Val Ile Thr Asn Pro Pro Tyr |      |
| 210 215 220   |      |
| aac cac aca atg gaa gtg gaa ata gga aaa cca gca agt att gcc tgt | 720  |
| Asn His Thr Met Glu Val Glu Ile Gly Lys Pro Ala Ser Ile Ala Cys |      |
| 225 230 235 240   |      |
| tca gct tgc ttt ggc aaa ggc tct cac ttc ttg gct gat gtc ctg tgg | 768  |
| Ser Ala Cys Phe Gly Lys Gly Ser His Phe Leu Ala Asp Val Leu Trp |      |
| 245 250 255   |      |
| cag att aac aaa aca gta gtt gga aat ttt ggt gaa gca aga att caa | 816  |
| Gln Ile Asn Lys Thr Val Val Gly Asn Phe Gly Glu Ala Arg Ile Gln |      |
| 260 265 270   |      |
| gaa gag gaa ggt cga aat gaa agt tcc agc aat gac atg gat tgt tta | 864  |
| Glu Glu Glu Gly Arg Asn Glu Ser Ser Ser Asn Asp Met Asp Cys Leu |      |
| 275 280 285   |      |
| acc tca gtg tta agg ata act ggt gtg aca gaa aag gac ctg tcc ctg | 912  |
| Thr Ser Val Leu Arg Ile Thr Gly Val Thr Glu Lys Asp Leu Ser Leu |      |
| 290 295 300   |      |
| gaa tat gac tgt ctg gcc ctg aac ctt cat ggc atg ata agg cac acc | 960  |
| Glu Tyr Asp Cys Leu Ala Leu Asn Leu His Gly Met Ile Arg His Thr |      |
| 305 310 315 320   |      |
| ata agg ctg aga agg aaa caa cca att gat cac cga agc atc tac tac | 1008 |
| Ile Arg Leu Arg Arg Lys Gln Pro Ile Asp His Arg Ser Ile Tyr Tyr |      |
| 325 330 335   |      |
| ata gtt gct gga tgt agt tga                                     | 1029 |
| Ile Val Ala Gly Cys Ser   |      |
| 340   |      |

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<400> 41

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1 5 10 15

Leu Pro Met Tyr Leu Thr Val Thr Glu Gly Ser Lys Ser Ser Trp Gly  
20 25 30

Leu Glu Asn Glu Ala Leu Ile Val Arg Cys Pro Gln Arg Gly Arg Ser  
35 40 45

Thr Tyr Pro Val Glu Trp Tyr Tyr Ser Asp Thr Asn Glu Ser Ile Pro  
50 55 60

Thr Gln Lys Arg Asn Arg Ile Phe Val Ser Arg Asp Arg Leu Lys Phe  
65 70 75 80

Leu Pro Ala Arg Val Glu Asp Ser Gly Ile Tyr Ala Cys Val Ile Arg  
85 90 95

Ser Pro Asn Leu Asn Lys Thr Gly Tyr Leu Asn Val Thr Ile His Lys  
100 105 110

Lys Pro Pro Ser Cys Asn Ile Pro Asp Tyr Leu Met Tyr Ser Thr Val  
115 120 125

Arg Gly Ser Asp Lys Asn Phe Lys Ile Thr Cys Pro Thr Ile Asp Leu  
130 135 140

Tyr Asn Trp Thr Ala Pro Val Gln Trp Phe Lys Asn Cys Lys Ala Leu  
145 150 155 160

Gln Glu Pro Arg Phe Arg Ala His Arg Ser Tyr Leu Phe Ile Asp Asn  
165 170 175

Val Thr His Asp Asp Glu Gly Asp Tyr Thr Cys Gln Phe Thr His Ala  
180 185 190

Glu Asn Gly Thr Asn Tyr Ile Val Thr Ala Thr Arg Ser Phe Thr Val  
195 200 205

Glu Glu Lys Gly Phe Ser Met Phe Pro Val Ile Thr Asn Pro Pro Tyr  
210 215 220

Asn His Thr Met Glu Val Glu Ile Gly Lys Pro Ala Ser Ile Ala Cys  
225 230 235 240

Ser Ala Cys Phe Gly Lys Gly Ser His Phe Leu Ala Asp Val Leu Trp  
245 250 255

Gln Ile Asn Lys Thr Val Val Gly Asn Phe Gly Glu Ala Arg Ile Gln  
260 265 270

Glu Glu Glu Gly Arg Asn Glu Ser Ser Ser Asn Asp Met Asp Cys Leu  
275 280 285

Thr Ser Val Leu Arg Ile Thr Gly Val Thr Glu Lys Asp Leu Ser Leu  
290 295 300

Glu Tyr Asp Cys Leu Ala Leu Asn Leu His Gly Met Ile Arg His Thr  
305 310 315 320

Ile Arg Leu Arg Arg Lys Gln Pro Ile Asp His Arg Ser Ile Tyr Tyr  
325 330 335

Ile Val Ala Gly Cys Ser  
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gat gcg tac atc att tac cct cgg gtc ttc cgg ggc agc gcg gcg gga 96  
Asp Ala Tyr Ile Ile Tyr Pro Arg Val Phe Arg Gly Ser Ala Ala Gly  
20 25 30  
acc cac tct gtg gag tac ttt gtt cac cac act ctg ccc gac gtt ctt 144  
Thr His Ser Val Glu Tyr Phe Val His His Thr Leu Pro Asp Val Leu  
35 40 45  
gaa aat aaa tgt ggc tac aaa ttg tgc att tat ggg aga gac ctg tta 192  
Glu Asn Lys Cys Gly Tyr Lys Leu Cys Ile Tyr Gly Arg Asp Leu Leu  
50 55 60  
cct ggg caa gat gca gcc acc gtg gtg gaa agc agt atc cag aat agc 240  
Pro Gly Gln Asp Ala Ala Thr Val Val Glu Ser Ser Ile Gln Asn Ser  
65 70 75 80  
aga aga cag gtg ttt gtt ctg gcc cct cac atg atg cac agc aag gaa 288  
Arg Arg Gln Val Phe Val Leu Ala Pro His Met Met His Ser Lys Glu  
85 90 95  
ttt gcc tac gag cag gag att gct ctg cac agc gcc ctc atc cag aac 336  
Phe Ala Tyr Glu Gln Glu Ile Ala Leu His Ser Ala Leu Ile Gln Asn  
100 105 110  
aac tcc aag gtg att ctt att gaa atg gag cct ctg ggt gag gca agc 384  
Asn Ser Lys Val Ile Leu Ile Glu Met Glu Pro Leu Gly Glu Ala Ser  
115 120 125  
cga cta cag gtt ggg gac ctg caa gat tct ctc cag cat ctt gtg aaa 432  
Arg Leu Gln Val Gly Asp Leu Gln Asp Ser Leu Gln His Leu Val Lys  
130 135 140

att cag ggg acc atc aag tgg agg gaa gat cat gtg gcc gac aag cag 480  
 Ile Gln Gly Thr Ile Lys Trp Arg Glu Asp His Val Ala Asp Lys Gln  
 145 150 155 160

tct cta agt tcc aaa ttc tgg aag cat gtg agg tac caa atg cca gtg 528  
 Ser Leu Ser Ser Lys Phe Trp Lys His Val Arg Tyr Gln Met Pro Val  
 165 170 175

cca gaa aga gcc tcc aag acg gca tct gtt gcg gct ccg ttg agt ggc 576  
 Pro Glu Arg Ala Ser Lys Thr Ala Ser Val Ala Ala Pro Leu Ser Gly  
 180 185 190

aag gca tgc tta gac ctg aaa cac ttt tga 606  
 Lys Ala Cys Leu Asp Leu Lys His Phe  
 195 200

<210> 43  
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Asp Ala Tyr Ile Ile Tyr Pro Arg Val Phe Arg Gly Ser Ala Ala Gly  
 20 25 30

Thr His Ser Val Glu Tyr Phe Val His His Thr Leu Pro Asp Val Leu  
 35 40 45

Glu Asn Lys Cys Gly Tyr Lys Leu Cys Ile Tyr Gly Arg Asp Leu Leu  
 50 55 60

Pro Gly Gln Asp Ala Ala Thr Val Val Glu Ser Ser Ile Gln Asn Ser  
 65 70 75 80

Arg Arg Gln Val Phe Val Leu Ala Pro His Met Met His Ser Lys Glu  
 85 90 95

Phe Ala Tyr Glu Gln Glu Ile Ala Leu His Ser Ala Leu Ile Gln Asn  
 100 105 110

Asn Ser Lys Val Ile Leu Ile Glu Met Glu Pro Leu Gly Glu Ala Ser  
 115 120 125

Arg Leu Gln Val Gly Asp Leu Gln Asp Ser Leu Gln His Leu Val Lys  
 130 135 140

Ile Gln Gly Thr Ile Lys Trp Arg Glu Asp His Val Ala Asp Lys Gln  
 145 150 155 160

Ser Leu Ser Ser Lys Phe Trp Lys His Val Arg Tyr Gln Met Pro Val  
 165 170 175

Pro Glu Arg Ala Ser Lys Thr Ala Ser Val Ala Ala Pro Leu Ser Gly  
 180 185 190



Lys Ala Cys Leu Asp Leu Lys His Phe  
 195 200

<210> 44  
 <211> 1357  
 <212> DNA  
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<220>  
 <221> CDS  
 <222> (47)..(1030)

<400> 44  
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 Met Gly Phe  
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tgg atc tta gca att ctc aca att ctc atg tat tcc aca gca gca aag 103  
 Trp Ile Leu Ala Ile Leu Thr Ile Leu Met Tyr Ser Thr Ala Ala Lys  
 5 10 15

ttt agt aaa caa tca tgg ggc ctg gaa aat gag gct tta att gta aga 151  
 Phe Ser Lys Gln Ser Trp Gly Leu Glu Asn Ala Leu Ile Val Arg  
 20 25 30 35

tgt cct aga caa gga aaa cct agt tac acc gtg gat tgg tat tac tca 199  
 Cys Pro Arg Gln Gly Lys Pro Ser Tyr Thr Val Asp Trp Tyr Tyr Ser  
 40 45 50

caa aca aac aaa agt att ccc act cag gaa aga aat cgt gtg ttt gcc 247  
 Gln Thr Asn Lys Ser Ile Pro Thr Gln Glu Arg Asn Arg Val Phe Ala  
 55 60 65

tca ggc caa ctt ctg aag ttt cta cca gct gaa gtt gct gat tct ggt 295  
 Ser Gly Gln Leu Leu Lys Phe Leu Pro Ala Glu Val Ala Asp Ser Gly  
 70 75 80

att tat acc tgt att gtc aga agt ccc aca ttc aat agg act gga tat 343  
 Ile Tyr Thr Cys Ile Val Arg Ser Pro Thr Phe Asn Arg Thr Gly Tyr  
 85 90 95

gcg aat gtc acc ata tat aaa aaa caa tca gat tgc aat gtt cca gat 391  
 Ala Asn Val Thr Ile Tyr Lys Lys Gln Ser Asp Cys Asn Val Pro Asp  
 100 105 110 115

tat ttg atg tat tca aca gta tct gga tca gaa aaa aat tcc aaa att 439  
 Tyr Leu Met Tyr Ser Thr Val Ser Gly Ser Glu Lys Asn Ser Lys Ile  
 120 125 130

tat tgt cct acc att gac ctc tac aac tgg aca gca cct ctt gag tgg 487  
 Tyr Cys Pro Thr Ile Asp Leu Tyr Asn Trp Thr Ala Pro Leu Glu Trp  
 135 140 145

ttt aag aat tgt cag gct ctt caa gga tca agg tac agg gcg cac aag 535  
 Phe Lys Asn Cys Gln Ala Leu Gln Gly Ser Arg Tyr Arg Ala His Lys  
 150 155 160

|   |      |
|---|------|
| tca ttt ttg gtc att gat aat gtg atg act gag gac gca ggt gat tac     | 583  |
| Ser Phe Leu Val Ile Asp Asn Val Met Thr Glu Asp Ala Gly Asp Tyr     |      |
| 165 170 175   |      |
| acc tgt aaa ttt ata cac aat gaa aat gga gcc aat tat agt gtg acg     | 631  |
| Thr Cys Lys Phe Ile His Asn Glu Asn Gly Ala Asn Tyr Ser Val Thr     |      |
| 180 185 190 195   |      |
| gcg acc agg tcc ttc acg gtc aag gat gag caa ggc ttt tct ctg ttt     | 679  |
| Ala Thr Arg Ser Phe Thr Val Lys Asp Glu Gln Gly Phe Ser Leu Phe     |      |
| 200 205 210   |      |
| cca gta atc gga gcc cct gca caa aat gaa ata aag gaa gtg gaa att     | 727  |
| Pro Val Ile Gly Ala Pro Ala Gln Asn Glu Ile Lys Glu Val Glu Ile     |      |
| 215 220 225   |      |
| gga aaa aac gca aac cta act tgc tct gct tgt ttt gga aaa ggc act     | 775  |
| Gly Lys Asn Ala Asn Leu Thr Cys Ser Ala Cys Phe Gly Lys Gly Thr     |      |
| 230 235 240   |      |
| cag ttc ttg gct gcc gtc ctg tgg cag ctt aat gga aca aaa att aca     | 823  |
| Gln Phe Leu Ala Ala Val Leu Trp Gln Leu Asn Gly Thr Lys Ile Thr     |      |
| 245 250 255   |      |
| gac ttt ggt gaa cca aga att caa caa gag gaa ggg caa aat caa agt     | 871  |
| Asp Phe Gly Glu Pro Arg Ile Gln Gln Glu Gly Gln Asn Gln Ser         |      |
| 260 265 270 275   |      |
| ttc agc aat ggg ctg gct tgt cta gac atg gtt tta aga ata gct gac     | 919  |
| Phe Ser Asn Gly Leu Ala Cys Leu Asp Met Val Leu Arg Ile Ala Asp     |      |
| 280 285 290   |      |
| gtg aag gaa gag gat tta ttg ctg cag tac gac tgt ctg gcc ctg aat     | 967  |
| Val Lys Glu Glu Asp Leu Leu Leu Gln Tyr Asp Cys Leu Ala Leu Asn     |      |
| 295 300 305   |      |
| ttg cat ggc ttg aga agg cac acc gta aga cta agt agg aaa aat cca     | 1015 |
| Leu His Gly Leu Arg Arg His Thr Val Arg Leu Ser Arg Lys Asn Pro     |      |
| 310 315 320   |      |
| agt aag gag tgt ttc tgagactttg atcacctgaa ctttctctag caagtgtaag     | 1070 |
| Ser Lys Glu Cys Phe   |      |
| 325   |      |
| cagaatggag tgtggttcca agagatccat caagacaatg ggaatggcct gtgccataaa   | 1130 |
| atgtgcttct cttcttcggg atgttggttg ctgtctgac tttgtagact gttcctgttt    | 1190 |
| gctgggagct tctctgctgc ttaaattggt cgtcctcccc cactccctcc tatcgttggt   | 1250 |
| ttgtctagaa cactcagctg cttcttttgggt catccttggt ttctaacttt atgaactccc | 1310 |
| tctgtgtcac tgtatgtgaa aggaaatgca ccaacaaccg aaaactg                 | 1357 |

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 <212> PRT

<213> Homo sapiens

<400> 45

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Ile Val Arg Cys Pro Arg Gln Gly Lys Pro Ser Tyr Thr Val Asp Trp  
35 40 45  
Tyr Tyr Ser Gln Thr Asn Lys Ser Ile Pro Thr Gln Glu Arg Asn Arg  
50 55 60  
Val Phe Ala Ser Gly Gln Leu Leu Lys Phe Leu Pro Ala Glu Val Ala  
65 70 75 80  
Asp Ser Gly Ile Tyr Thr Cys Ile Val Arg Ser Pro Thr Phe Asn Arg  
85 90 95  
Thr Gly Tyr Ala Asn Val Thr Ile Tyr Lys Lys Gln Ser Asp Cys Asn  
100 105 110  
Val Pro Asp Tyr Leu Met Tyr Ser Thr Val Ser Gly Ser Glu Lys Asn  
115 120 125  
Ser Lys Ile Tyr Cys Pro Thr Ile Asp Leu Tyr Asn Trp Thr Ala Pro  
130 135 140  
Leu Glu Trp Phe Lys Asn Cys Gln Ala Leu Gln Gly Ser Arg Tyr Arg  
145 150 155 160  
Ala His Lys Ser Phe Leu Val Ile Asp Asn Val Met Thr Glu Asp Ala  
165 170 175  
Gly Asp Tyr Thr Cys Lys Phe Ile His Asn Glu Asn Gly Ala Asn Tyr  
180 185 190  
Ser Val Thr Ala Thr Arg Ser Phe Thr Val Lys Asp Glu Gln Gly Phe  
195 200 205  
Ser Leu Phe Pro Val Ile Gly Ala Pro Ala Gln Asn Glu Ile Lys Glu  
210 215 220  
Val Glu Ile Gly Lys Asn Ala Asn Leu Thr Cys Ser Ala Cys Phe Gly  
225 230 235 240  
Lys Gly Thr Gln Phe Leu Ala Ala Val Leu Trp Gln Leu Asn Gly Thr  
245 250 255  
Lys Ile Thr Asp Phe Gly Glu Pro Arg Ile Gln Gln Glu Glu Gly Gln  
260 265 270  
Asn Gln Ser Phe Ser Asn Gly Leu Ala Cys Leu Asp Met Val Leu Arg  
275 280 285

Ile Ala Asp Val Lys Glu Glu Asp Leu Leu Leu Gln Tyr Asp Cys Leu  
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Ala Leu Asn Leu His Gly Leu Arg Arg His Thr Val Arg Leu Ser Arg  
 305 310 315 320

Lys Asn Pro Ser Lys Glu Cys Phe  
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 agatgcccc aaagaggacg ctgacttat cctgtggaat ggtattactc agatacaaat 180  
 gaaagtattc ctactcaaaa aagaaatcgg atctttgtct caagagatcg tctgaagttt 240  
 ctaccagcca gagtcgaaga ctctgggatt tatgcttgtg ttatcagaag cccaacttg 300  
 aataagactg gatacttgaa tgtcaccata cataaaaagc cgccaagctg caatatccct 360  
 gattatttga tgtactcgac agtacgtgga tcagataaaa atttcaagat aagctgtcca 420  
 acaattgacc tgtataattg gacagcacct gttcagtggg ttaagaactg caaagctctc 480  
 caagagccaa ggttcagggc acacaggtcc tacttgttca ttgacaacgt gactcatgat 540  
 gatgaagggtg actacacttg tcaattcaca cagcgggaga atggaaccaa ctacatcgtg 600  
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[illegible]

Gln Ile Asn Lys Thr Val Val Gly Asn Phe Gly Glu Ala Arg Ile Gln  
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Glu Glu Glu Gly Arg Asn Glu Ser Ser Ser Asn Asp Met Asp Cys Leu  
275 280 285

Thr Ser Val Leu Arg Ile Thr Gly Val Thr Glu Lys Asp Leu Ser Leu  
290 295 300

Glu Tyr Asp Cys Leu Ala Leu Asn Leu His Gly Met Ile Arg His Thr  
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Ile Arg Leu Arg Arg Lys Gln Pro Ser Lys Glu Cys Pro Ser His Ile  
325 330 335

Ala

<210> 49  
<211> 337  
<212> PRT  
<213> Mus musculus

<400> 49  
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Leu Pro Met Tyr Leu Thr Val Thr Glu Gly Ser Lys Ser Ser Trp Gly  
20 25 30

Leu Glu Asn Glu Ala Leu Ile Val Arg Cys Pro Gln Arg Gly Arg Ser  
35 40 45

Thr Tyr Pro Val Glu Trp Tyr Tyr Ser Asp Thr Asn Glu Ser Ile Pro  
50 55 60

Thr Gln Lys Arg Asn Arg Ile Phe Val Ser Arg Asp Arg Leu Lys Phe  
65 70 75 80

Leu Pro Ala Arg Val Glu Asp Ser Gly Ile Tyr Ala Cys Val Ile Arg  
85 90 95

Ser Pro Asn Leu Asn Lys Thr Gly Tyr Leu Asn Val Thr Ile His Lys  
100 105 110

Lys Pro Pro Ser Cys Asn Ile Pro Asp Tyr Leu Met Tyr Ser Thr Val  
115 120 125

Arg Gly Ser Asp Lys Asn Phe Lys Ile Thr Cys Pro Thr Ile Asp Leu  
130 135 140

Tyr Asn Trp Thr Ala Pro Val Gln Trp Phe Lys Asn Cys Lys Ala Leu  
145 150 155 160

Gln Glu Pro Arg Phe Arg Ala His Arg Ser Tyr Leu Phe Ile Asp Asn  
165 170 175

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Thr | His | Asp | Asp | Glu | Gly | Asp | Tyr | Thr | Cys | Gln | Phe | Thr | His | Ala |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Glu | Asn | Gly | Thr | Asn | Tyr | Ile | Val | Thr | Ala | Thr | Arg | Ser | Phe | Thr | Val |
|     |     | 195 |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |
| Glu | Glu | Lys | Gly | Phe | Ser | Met | Phe | Pro | Val | Ile | Thr | Asn | Pro | Pro | Tyr |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Asn | His | Thr | Met | Glu | Val | Glu | Ile | Gly | Lys | Pro | Ala | Ser | Ile | Ala | Cys |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ser | Ala | Cys | Phe | Gly | Lys | Gly | Ser | His | Phe | Leu | Ala | Asp | Val | Leu | Trp |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Gln | Ile | Asn | Lys | Thr | Val | Val | Gly | Asn | Phe | Gly | Glu | Ala | Arg | Ile | Gln |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     |     | 270 |     |
| Glu | Glu | Glu | Gly | Arg | Asn | Glu | Ser | Ser | Ser | Asn | Asp | Met | Asp | Cys | Leu |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Thr | Ser | Val | Leu | Arg | Ile | Thr | Gly | Val | Thr | Glu | Lys | Asp | Leu | Ser | Leu |
|     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |
| Glu | Tyr | Asp | Cys | Leu | Ala | Leu | Asn | Leu | His | Gly | Met | Ile | Arg | His | Thr |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Ile | Arg | Leu | Arg | Arg | Lys | Gln | Pro | Ser | Lys | Glu | Cys | Pro | Ser | His | Ile |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |

Ala